

Plugging Abandoned Water Wells



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Texas groundwater resources are critical to meeting our future needs

Water is one of our state's most precious resources. Groundwater from aquifers (underground layers of porous rock or sand containing water, into which wells can be drilled) supplies over half of the water used in the state. Protecting the quality of this vital resource is the responsibility of all Texans.

For many years groundwater has been pumped through water wells. Over the years, many wells around homes, farms, industrial sites, and urban areas have been abandoned without being properly plugged. Not only are these wells potential means for contaminants to reach the groundwater, many are safety hazards to children and animals. Although plugging an abandoned well takes time and money, these wells are a threat that cannot be ignored.

Under Texas law, a landowner is responsible for plugging abandoned wells on his or her property and, therefore, liable for any water contamination or injury that might result from such a well. This publication is provided to help landowners understand how to plug a well properly. It is recommended that before you begin the process of plugging an abandoned well that you seek advice from your local groundwater conservation district, a licensed water well driller in your area, or the Water Well Drillers Program with the Texas Department of Licensing and Regulation (TDLR).

Abandoned wells are a threat to our water supply

An abandoned well is a direct channel from the surface to the aquifer below. Contaminants that enter a well are introduced directly into the aquifer with no opportunity for natural filtration by soils or geologic materials. If a concentrated chemical enters a well, it may reach levels in the underlying aquifer that threaten human health. This puts other wells in the aquifer at risk, particularly those wells on the same property or those that are close to the abandoned well.

In many areas of Texas, deep aquifers are under high pressures and some are extremely salty. A well open to more than one aquifer will allow water to

migrate from a zone with higher pressure to a zone with lower pressure. When the casing from a high pressure well deteriorates and the well is abandoned without proper plugging, upward flow of salty water from the deeper aquifer may cause contamination of the shallow, fresh water aquifer. Also, any pollutants that occur in one zone can migrate to another zone through a well.

Unplugged abandoned wells may deplete pressure within an aquifer. Pressure in artesian aquifers decreases as water discharges at land surface or to less pressurized aquifers. Eventually a drop in pressure causes flowing wells to stop flowing and the water level in nearby wells in the same aquifer to decline.

When is a well considered abandoned?

According to Texas law, a well is considered abandoned if it has not been used for six consecutive months. However, a non-deteriorated well can be considered in use if it contains a casing, pump, and pump column in good condition or if it has been capped.

If you are uncertain whether your well is legally abandoned, call a licensed water well driller in your area, the Water Well Drillers Program of the TDLR, or the local groundwater conservation district.

Who can plug an abandoned well?

The three people who can legally fix an abandoned well are the landowner, a licensed well driller and a licensed pump installer. Landowners are limited to the simpler well construction methods and to wells with less than 100 feet of standing water in the well.

As the landowner, you may do the work necessary to plug an abandoned well on your property. If you plan to do so, first notify the Water Well Drillers Program of the TDLR of your intent to plug the well and the method you will use. You should also request a state well-plugging form. Within 30 days after the well is plugged, you must send a copy of the form to the TDLR. Also, send a copy to the local groundwater conservation district.

If the well is within a groundwater conservation district, notify the district of your intention to plug the well. Request the district's plugging application and pay applicable fees if required. Consult district professionals about any other requirements.

In some cases it is recommended that you hire a licensed water well driller or pump installer to seal and plug an abandoned well. Well contractors have the equipment and an understanding of soil conditions to determine how a well should be properly plugged.

How can you take care of an abandoned well?

An abandoned well can be fixed by three different methods:

- ◆ Return the well to an operable state by making sure the casing, pump and pump column are in good condition.
- ◆ Cap the well to prevent surface water or contaminants from entering the well. The cap should support 400 pounds and should not be easily removable by hand.
- ◆ Plug the well from the bottom to the top with bentonite (a porous clay that swells), bentonite grout or portland cement (a kind of cement that hardens under water). Large diameter wells can be filled with clay or caliche soil.

What are the steps in plugging an abandoned well?

Step 1. Determine the size of well. Measure the dimensions of the well—diameter, depth, and water level. Accurate measurements (not estimates) allow the correct calculation of the total well volume and the volume of water in the well. This information is needed to determine the amount of materials needed for plugging.

Step 2. Remove debris from well. Remove all obstructing materials from the well. It is critical that fill materials do not slump or settle; therefore, obstructions that may cause incomplete filling of the

space must be eliminated. Remove the pump, pump rods, pipes, and floating debris, such as wood.

Step 3. Disinfect the well. Wells containing standing water must be disinfected to kill microorganisms. This can be done by adding chlorine bleach at the rate of 1 gallon of bleach for every 500 gallons of water, equivalent to a “shock” chlorination concentration of 100 parts per million chlorine. The chlorination process ensures that disease-causing microorganisms are not sealed in the aquifer.

Step 4. Remove as much casing as possible. This will eliminate the route for contaminants to reach the aquifer below.

Step 5. Fill the well with plugging materials. The exact procedure for plugging will depend on well construction, depth, diameter, aquifer type, availability of materials, and the level of protection required. Figures 1-3 illustrate three different methods used to plug a well properly based on the well type (hand dug or drilled) and amount of water standing within the well (more or less than 100 feet of standing water). Figure 1 shows plugging a large diameter well, while Figure 2 shows a small diameter well similar to the wells in the many aquifers within the state.

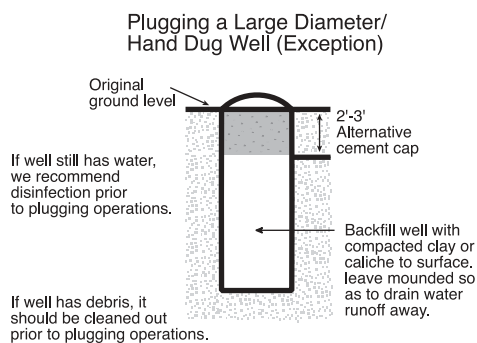


Figure 1. Plugging a large diameter well.

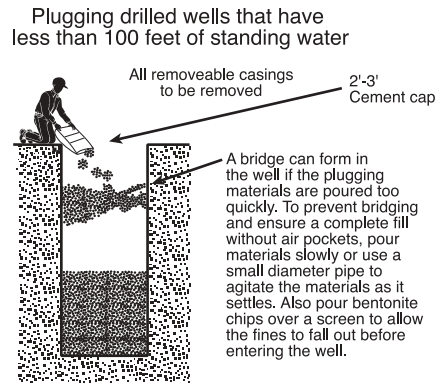


Figure 2. Plugging a well with bentonite chips.

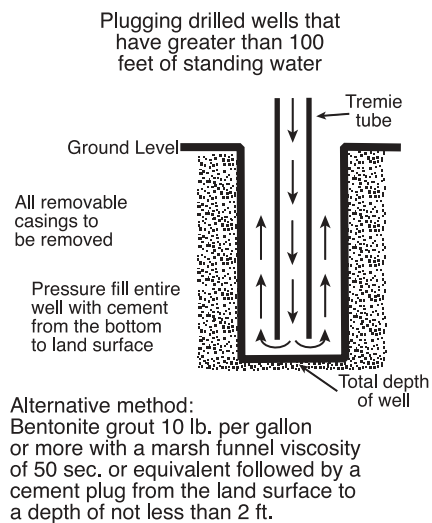


Figure 3. Plugging a well with a tremie tube.

Step 6. Complete and mail a state plugging form to the Texas Department of Licensing and Regulation at the address indicated below. (The form can be downloaded from the TDLR website, www.license.state.tx.us.) Comply with reporting and requirements of your local groundwater conservation district.

Texas Department of Licensing and Regulation
Water Well Drillers Program
P.O. Box 12157
Austin, Texas 78711

Some areas of Texas have assistance programs for plugging abandoned wells. Contact your local groundwater conservation district and soil and water conservation board to see if the program is available in your area.

The Texas Groundwater Protection Committee publishes a fact sheet titled "RG-347—Landowners Guide to Plugging Abandoned Water Wells," describing the plugging of abandoned wells. This fact sheet can be obtained through the TNRCC web site. Additional information can be obtained by visiting the following web sites:

Texas Natural Resource Conservation Commission—
www.tnrcc.state.tx.us
Texas Department of Licensing and Regulation—
www.license.state.tx.us
Texas Cooperative Extension—
<http://texaswater.tamu.edu>

Contacts for Additional Information:

Texas Department of Licensing and Regulation
Local Groundwater Conservation District
Local Soil and Water Conservation Board
Local County Extension Agent
Texas Department of Agriculture
Texas Rural Water Association
Texas Farm Bureau

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Texas Water Well Drillers Advisory Council
Texas Rural Water Association
Texas Farm Bureau
Texas Groundwater Protection Committee

Member agencies:
Texas Natural Resource Conservation Commission
Texas Water Development Board
Railroad Commission of Texas
Texas Department of Health
Texas Department of Agriculture
Texas Department of Licensing and Regulation
(Water Well Drillers Program)
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